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University of Missouri

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In furtherance of University business programs he has served on the Executive Committee of the Central Association of College and University Business Officers. Also he helped organize the "Big 8" Universities' Business Officers group.

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Functions of State University Comptrollers

R. H. Bezoni
Comptroller
University of Missouri

The trend of the times is toward a progressively expanding economy. This trend is intensified in the field of higher education. In past decades, when higher education was limited in scope and represented a minute portion of the total economy, the demands on the business operations side of higher education were also limited. As a result business operations of universities and colleges were based upon skeletal procedures, which differed basically from those designed for today's dynamic expansion.

In recent years, higher education has come of age and has been confronted by world wide recognition of its importance. This importance is being emphasized not only in teaching and research, but also in regard to the direct assistance which universities must provide to industry, government, the arts and numerous other fields.

University administration

These dynamic changes in the concept of business operations in the field of higher education have made certain other changes necessary. Administrative personnel have had to exert concerted efforts to meet the challenge and provide their universities and colleges with the necessary business tools to carry out the new and more profound responsibilities assigned to them. One of the officers in University administration today to whom this challenge is presented is the Comptroller.

Although a large University does not function and cannot be operated exactly as a modern corporation, the duties and functions of the Comptroller in each are somewhat similar. His duties are basically to assist the faculty and administration in securing the largest possible return from the funds available in terms of the various programs of the University.

COMPTROLLERS' RESPONSIBILITIES

The functions and responsibilities of the comptroller for an institution such as the University of Missouri are generally as follows:

1. **To assist in establishing, coordinating and maintaining an integrated plan of operations. At the University of Missouri this plan is the budget.**

Such a plan is essential for the University to fulfill its ultimate objectives—the educational, research and service programs. It is brought about through the use of all available tools—such as experience derived from past operations, forecasting of needs for the future including estimates of revenues which will be available for meet-

ing the expenses of the various programs, statistics, interpretation of data and analysis of operations of similar institutions.

Development of such a plan not only takes into consideration what the needs are for the next fiscal year or the next biennial period but requires a look into the future as to what the long-range needs of the institution might be.

Continuing surveys of rates of pay for both the academic and the non-academic personnel are necessary. Keeping abreast of related personnel policies and the extent of the fringe benefit programs at other educational institutions in order that a competitive position may be maintained is important. A good plan should include also a determination of what the needs will be for laboratory and classroom facilities and equipment.

Budgeting

As one might expect, the budget is not developed by any one individual. In order to be effective it represents the combined efforts of many people. Such a plan of operations must then be recommended by the President of the University and approved by the Governing Board.

In the case of the University of Missouri the budget is developed on a yearly basis for internal purposes and on a biennial basis for presenting University needs to the State of Missouri. With respect to appropriation requests made to the Missouri General Assembly by the University for buildings and other capital items, such a program of needs extends over a long-range period of from 10 to 15 years.

A very good example of long-range planning being carried out at the University of Missouri is a study of future space needs and effective space utilization. This continuing study is carried out by a special committee from the University with the assistance of staff members from the Division of Budget and Comptroller of the State of Missouri. This study attempts to project the needs for classrooms, laboratories and other special facilities to meet the increasing enrollment.

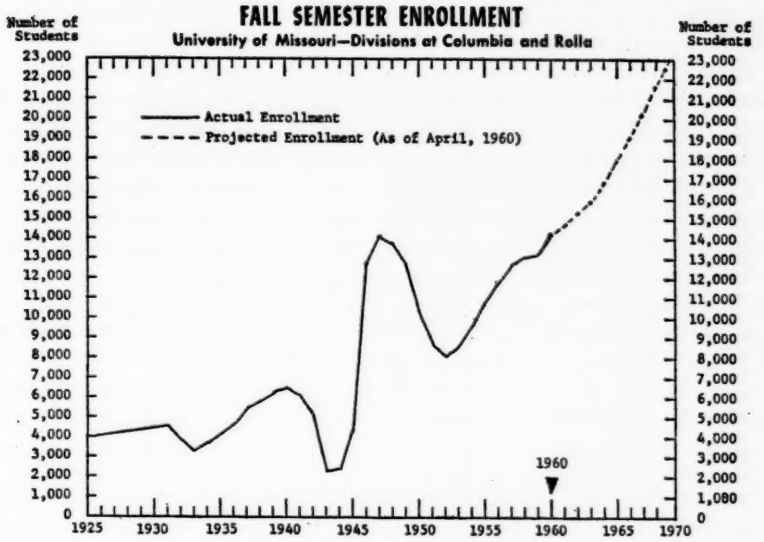
The size and scope of the operations of the University of Missouri in the fiscal year 1960-61 may be reflected by the amounts being expended. During this one year period current expenditures will approach $35,000,000. This does not include the amounts expended for buildings and other related capital items. The contracts for a major portion of these projects are awarded on the basis of competitive bids,[1] and money to finance these items is provided by state appropriations, sale of revenue bonds for housing and Union building facilities, loans through foundations and other miscellaneous sources.

A conservative estimate of the expected growth in the student body at the University of Missouri through 1970 is shown in the accompanying chart.

2. To measure performance against approved operation plans and standards and to report and interpret the results of operations to University staff and others.

This measure of performance is brought about through the design, installation and maintenance of accounting, cost systems and records as well as the development of statistics which may be required. This includes the collection, analysis and interpretation of data relating to past performance and its translation into valuable information for future operations. In carrying out this function with members of the University staff it is essential to develop approximate data, which will be timely, rather than precise data which will be too old to be of any effective use.

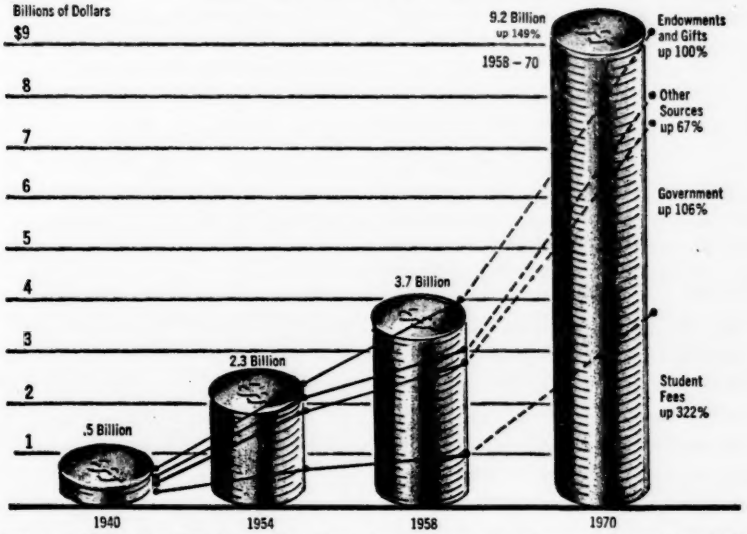
[1] The management of this area of new construction and plant improvements is one of the functions of the University Business Manager.



Type of statements

The responsibility of the Comptroller is not completely fulfilled by the preparation of financial statements. It is only fulfilled if the statement is prepared in such a manner that the reader may understand it easily and quickly.

This function is especially important in



*From **Financing Higher Education**, by Dexter M. Keezer. Copyright 1959, McGraw-Hill Book Company, Inc.

the preparation of supporting data for the State Division of Budget and Comptroller, the Legislature and other state officials who may participate in arriving at the amounts to be appropriated to the University of Missouri for each operating period.

It has been learned that the use of brief, summary data for reporting to outside groups is more effective in telling the story about University operations than voluminous, detailed financial reports. For example, a report showing the sources of operating funds and how such funds were used for all divisions of the University of Missouri for the fiscal year ended June 30, 1960 is shown below.

SOURCES AND USES OF FUNDS

The Operating Money Came From	
Student Fees	9.6%
Appropriations:	
State of Missouri	50.4
Federal Government	9.3
Earnings from instructional departments and self-supporting activities	23.3
Gifts, Grants and Endowment Income	7.4
	100.0%

The Operating Money Was Used For	
Instruction and Research	40.3%
Extension and Public Services	13.3
Libraries	2.4
Physical plant operations including principal and interest on revenue bonds	12.1
Self-supporting and instructional departments activities	22.7
Scholarships, fellowships and prizes	.6
Administration of University	2.1
General expenses	6.5
	100.0%

be taken of the operations of the entire institution.

It is especially important that sufficient time be available for studies of the organizational structure not only within the Comptroller's Office but throughout the entire University. Observations and suggestions for improvement of organizational effectiveness are made to the President for his consideration.

4. To report to government agencies, as required, and to supervise matters relating to taxes.

This area has become more complex since World War II with the vast amount of research work which is now being performed by the University in connection with various Federal and state governmental agencies.

Although publicly controlled and supported universities do not have as many tax problems as do private universities, there are still a number of tax matters which are administered through the Comptroller's Office. These are primarily within the area of employee benefits.

5. To interpret and report on the effect of external influences on the attainment of institutional objectives.

3. To measure and report on the validity of the long-range objectives of the institution, and on the effectiveness of policies, organizational structure and procedures followed in attaining those objectives.

In order to carry out this function it becomes necessary for the Comptroller to consult with the Deans, Directors and department chairmen in the various University divisions. This consultation affords opportunity to visualize the overall broad picture of the plan of operations and how each program is related to other programs. It is important here that an objective view

This function includes the continuous appraisal of economic and social forces and of governmental influences as they affect operations. Much time is now spent by the financial officers of educational institutions in dealing with the many complexities of contracts with the Federal and State Governments and the effects of such contracts on the educational and financial policies of the institution. Here is a list of the various Federal and State Government agencies with which the University has contracts for research programs:

Federal Agencies

National Institute of Health
Office of Education
Atomic Energy Commission
Agriculture
National Science Foundation
The Army
The Air Force
The Navy
Commerce
Interior

State Agencies

Highway Commission
Park Board
Conservation Commission
Agriculture
Public Health and Welfare

6. To provide protection for the assets of the institution.

This area includes the establishment and maintaining of adequate internal control and auditing. It is exceedingly important that good internal control be established to protect the assets of the institution. This includes the activities of an internal auditor who complements, rather than duplicates, the work of independent outside auditors and audit representatives of various governmental agencies.

The work of the internal audit office covers a wide area. This includes the checking for compliance with policy directives, adequacies of internal controls and effectiveness of established systems and procedures. The internal audit staff also is used to good advantage in explaining to University personnel the reasons for internal control procedures.

Financial and system review

In order to make available funds go as far as possible it is extremely important that the Comptroller carry on a continuing self study of all operations. This will include the study and review of existing methods, systems and procedures as well as organization and management efforts.

For example, periodic reviews are necessary to see that the University's investment agents are getting the best yield, on the various University funds which are invested, and to make certain that such investment programs are being administered in a sound, businesslike manner.

Such studies and review of policies and procedures are brought about by the Comptroller who may use qualified consultants. For example, outside actuarial consultants as well as University academic staff members are used in the administration of the University Retirement and Insurance programs.

COMPTROLLER'S RELATIONSHIPS

Much has been written and said in recent years concerning the desired relationship which should exist between the University business officer and members of the University faculty and others. One of the better articles dealing with this matter was published in "College and University Business" (June 1960)[2] by Mr. Clarence Scheps, Business Vice President for Tulane Uni-

versity. The highlights of this article are as follows:

1. It must be accepted on the part of the business officer that finance and business are not the end purposes for which an educational institution exists. It must be realized that instruction, research and public service are the primary functions of higher learning institutions. In order to accomplish these goals there must be a joint and cooperative effort of the faculty, the academic administration and the business administration.
2. Good business and financial management exist to serve the institution by maintaining and conserving institutional resources, by providing accurate and current financial information and making available good management of its diversified operations of which each large University has many.
3. The business office staff must be well informed as to the educational objectives and aims of the institution and should be sympathetic toward them. Any attempt to separate business from the academic, except on the narrow basis of technics, is unreal and artificial.
4. The educational business officer is committed to keep abreast of new methods and technics which may result in increased efficiency. The efficiency of any educational institution, unlike that of an industrial enterprise, cannot be judged solely on the basis of a low unit cost of production. Programs should not be cheapened and made less qualitative in order to show a low performance cost. In making suggestions which might increase the efficiency of the institution the business officer has to use good judgment and discretion in the way in which such suggestions are made.
5. The University business officer should discipline himself to keep abreast of what is being done in higher education in other states. This is important in that he may learn of new systems and technics which may be applicable in his own institution. He should keep informed of national problems affecting higher education as these same problems will, in all probability, affect operations at the local level.

   College and University business officers have their association groups, which among other things, afford the means of keeping abreast of changes in problems affecting higher education. For example, there are regional association groups of College and University business officers throughout the United States. In addition, there is "The National Federation of College and University Business Officers."[3]
6. Finally, it is not sufficient that the business administration be efficient and well organized but; in addition, it should be responsible for developing new technics in orienting the faculty and University staff in sound financial administration. Personal conferences with the operating heads as well as the use of business policy and procedure manuals are ways of bringing this about.

SUMMARY

In summary, the University Business Officer is concerned with people and programs. The degree to which he contributes, along with the other officers of the University administration, in consolidating the two into an efficient operating unit will affect materially the success which his University will attain in these changing and challenging times.

[2] Published monthly by The Modern Hospital Publishing Co., Inc. (subsidiary of F. W. Dodge Corporation), 1050 Merchandise Mart, Chicago 54, Illinois.

[3] This is a new organization which serves generally toward constant improvement of business management in colleges and universities. It cooperates with other organizations in its general interest in education including the American Council on Education, U. S. Office of Education, Association of Land Grant Colleges, Association of American Colleges and others with similar national programs.

It also serves as a clearing house to keep college and university business management better informed on all matters pertaining to higher education. Membership in this organization consists of the regular members of the American, Central, Eastern, Southern and Western Association of College and University Business Officers. It is expected that permanent headquarters will be in Washington, D. C.

The Second of a Two-Part Analysis of Long-Range Planning for Highways

Long-Range Physical and Financial Planning for Highways

C. A. STEELE
Chief, Highway Economics Branch
Highway Needs and Economy Division
Office of Research
Bureau of Public Roads
Washington, D. C.

A comprehensive highway needs study is designed to measure on a statewide or nationwide basis both the present and future demands for highways and highway services, to determine what kind of a highway network will be required to meet these demands and how much it will cost to own it, to investigate the fiscal impact of such a program and suggest how it may be financed adequately and equitably, and to suggest how the improved highway network may be administered most effectively. However, by no means all of the long-range highway needs studies that have been or are being made, or are contemplated, are of the comprehensive type. The variations of the less-than-comprehensive studies are legion; sometimes only a single system, usually the State primary, is studied, or a physical needs study only is made, or a financing study only. However, the general procedures employed in a partial study should be essentially those employed in the comparable portions of a comprehensive study. Therefore, this article deals only with the procedures that would normally be adopted for the comprehensive study.

It has already been stated[13] that the engineering or physical needs study lends itself rather readily to "package" treatment because of the essential similarity of the situations found from one State to another, and from one period of time to another. Differences exist, of course, but these are largely differences of degree rather than kind, and the treatments accorded are basically the same. Technological changes—changes in design standards, for example—must also be taken into account, but, again, the methods of attack on the problem of needs measurement remain essentially similar. For these reasons the excellent discussion of engineering needs study procedures provided in the Farrell article previously cited is still pertinent.

[13] Part One of Mr. Steele's article appeared in the March-April issue of the **Review.** Footnotes are numbered consecutively beginning with Part One.

COORDINATION OF STUDIES

Before the measurement of engineering or physical needs is begun it is necessary to develop (or obtain from other sources) certain types of background information that are required for it. Since this information is also required for the fiscal study, the staffs of the two studies may well collaborate in its assembly and development, or the one staff may agree to accept material provided by the other.

Included in this category of background information are demographic and economic data bearing upon the present and future demand for highways and highway services; also historical material indicating how the highway network of the State has developed to its present levels, and how responsibility for its management and financing has developed.

MEASUREMENT OF NEEDS

As Farrell so aptly stated: "Probably the greatest single problem in a study of highway needs, from the standpoint of planning, time, effort, and coverage, is the work that must be done by the various jurisdictional units in connection with determining the costs of their respective future road improvement programs."[14] He divided the work program for this phase of the study into three operations:

1. Classification of roads and streets into logical systems;
2. Field appraisal of improvements needed;
3. Processing and analysis of collected data.

Before the field work is begun operating manuals must be devised to delineate the specifications, procedures, and forms under which the study is to be conducted. A separate manual must be prepared for each level of government for which an appraisal is to be made—the State, counties, townships and incorporated places, for example. The complexity and detail of the individual manuals will differ among the various levels of government in conformity with the character of the road systems under the jurisdiction of each, and the degree and caliber of the engineering supervision under which each system is administered. Thus, very rigid criteria requiring great detail in the information assembled can be applied in estimating State highway needs, but only much broader criteria requiring a minimum of detail can be applied in the case of small local jurisdictions such as townships.

Two sets of standards will customarily be delineated in the needs manual. One set, usually designated "tolerable" standards, will be applied when the observed deficiencies of a road section are such that it apparently can be kept in condition to render satisfactory service for several years with a minimum of improvement. A road section is considered to be eligible for immediate reconstruction when it fails to measure up to these tolerable standards in most major elements. Then, another set of standards, generally labeled "design" or "construction" standards will be applied.

The two sets of standards will be subdivided into two major categories, "roadway" and "structures." They will prescribe permissible minimums of right-of-way width, design speeds, gradients, curvature, surface and shoulder widths, surface type and thickness, number of lanes, and load capacity of structures. These will be related to the volume and composition of traffic expected at some predetermined date in the case of "construction" standards, or to present traffic in the case of "tolerable" standards.

The forms provided for reporting on existing conditions and needs will include a section for identification of the road segment, indicating the administrative system to which it belongs, the route number (if any), and the exact location (county, rural

[14] Op. cit., p. 123.

or urban area). A section for showing existing conditions will provide for entering segment length, cross-section, surface type and width, present traffic, traffic capacity, and observed deficiencies. Another section will indicate the nature of proposed improvements, and the expected traffic increase which will require them. A final section of the form will provide for estimating the total and unit costs of the improvement required.

Much of the success eventually achieved in obtaining acceptance of and support for the finally recommended needs program will depend upon the extent to which the levels of government directly responsible for the various highway systems participate in the evaluation of need and cost determination, and development of financing plans for the classes of highways under their jurisdiction. Such participation may be achieved in one or more of several ways:

1. By representation on the committee set up to sponsor a statewide highway needs study;
2. By representation on advisory committees to the study committee and/or operating staffs;
3. By representation of the project planning staff, especially the staff responsible for development of manuals and forms;
4. By participation in the actual determination of needs in the field;
5. By participation in the preliminary review of the physical and fiscal program recommendations.

Participation in the field determination of needs for each of the various highway systems by the governmental unit or units responsible for its administration is especially desirable, but is often limited by the size and nature of the staffs of the individual governmental units. The needs determinations for the State-administered highways are usually made by highway department engineers. When necessary these crews can also perform the same services for counties or local jurisdictions. If a consultant is employed for the engineering needs study, it may be desirable for his staff to undertake the physical needs evaluation for those governmental units not staffed to make their own evaluations if in the opinion of officials of those units department employees would not be likely to make impartial evaluations.

Highway classification

The first step in the needs evaluation program as normally set up is the classification of highways into functional systems. This should be done independently and in advance of the engineering determination of the needed improvements. The classification study is fundamentally a sorting of existing roads and streets into functional categories, taking into account nature and amount of use, system integration (of major systems), and suitability for administration and financing by a particular type of governmental unit. Much of the classification can be done from detailed maps, but some field checking will usually be necessary, especially in the case of "borderline" road sections. In its initial stage, the classification allocation should be made strictly according to prescription, but some modification may later become necessary during the final review of the initial assignments.

Highways are ordinarily classified into three broad functional groupings on the basis of the type of service rendered: Primary (basically serving through traffic), secondary (arterial, collector, or feeder routes), and tertiary (predominantly land service). Local conditions or legal requirements may dictate modification or further subdivision of these principal groupings, but the fundamental classification would still apply.

The results of the classification study

will indicate what standards should be applied in evaluating each section of road in the needs-determination phase. If the existing classification is fundamentally rational the differences arising from the classification study will be minor, but if the existing classification is unsound the differences indicated by it will be extensive. Thus, if the State primary system has been overextended, a careful classification study will indicate many roads now on the State system that do not warrant being there. On the other hand, a too greatly restricted secondary system will be indicated by the discovery of extensive road mileage on the local system that is obviously performing secondary- or feeder-road service.

Field appraisal of needs

As the classification study nears completion, the field measurement of needs can begin. Here the work is closely governed by the previously prepared manuals applying to the functional classifications to which the individual road sections have been assigned. Normally, general supervision of this activity will be directly by the engineering-needs-study staff, with the evaluation teams composed of employees (mostly engineers or engineering aids) of the jurisdictions responsible for the various road and street systems. However, as previously stated, State highway department employees often are called upon to assist with or make the evaluations for the smaller jurisdictions not staffed with engineers, such as the less populous counties, townships, and incorporated places.

For a comprehensive needs study, the physical needs evaluation will involve every mile of road and street in the State. However, the lengths of the individual sections for which the needs determinations are made will ordinarily vary more or less inversely with the importance of the system on which they are located. Thus, the road sections on the rural State highway system might average less than 5 miles, while those on the local or land-service rural system might include all the roads of that class within a county.

As the individual reports of deficiencies and needs are completed they are submitted to the engineering-needs study staff which reviews them for completeness, accuracy, consistency, and adherence to instructions. This "screening" process is one of the most important steps in the needs-determination program because it enables the staff to detect inaccurate, incomplete, or unrealistic estimates, which can then be referred back to the reporting agency for reconsideration and revision. Disagreements between the reporting agencies and the study staff are ironed out at this stage.

In his *Public Roads* article Farrell estimated that the classification and appraisal phases of an engineering needs study may be expected to require from six to eight months on the average,[15] but that the time required in any given instance may be expected to vary because of the action of such factors as the complexity of the jurisdictional structure for highway administration and the degree of cooperation obtained from highway officials at all levels.

Processing and analysis

Upon completion of the screening phase, the processing and analysis of the physical needs estimates can be started. If the field appraisals have been well-made on forms that provided for recording all of the needed information these steps become relatively simple, although time-consuming. In most comprehensive studies the volume of data to be handled is such as to require the application of automatic data processing methods to get the job done most efficiently and in a reasonable period of time.

The end result of this step in the study,

[15] Op. cit., p. 123.

which will require several months for its completion, will be a series of tabulations indicating the nature and magnitude of the physical construction or reconstruction required for each road system. These tabulations should provide not only for indicating the volume of work to be done but also the estimated costs of these improvements, which are determined during this phase on the basis of estimates provided during the field evaluation of needs.

DEVELOPING THE PROGRAM

The next step in the engineering needs study is the extremely important but delicate one of developing the specific program or programs to be recommended for adoption. Although the actual determination is an empirical back-and-forth process, it necessarily involves the following steps which will be considered in the order named: scheduling, cost determination, and pricing.

The aim of the program will be to provide a highway network, each segment of which will be adequate to carry the volume and weight of traffic expected to be imposed upon it at any future time up to the end of the period covered by the study. One or more schedules for achieving this aim will be provided in the final report and its supporting documents; the alternatives might include two or more schedules for completing the entire program, or they might provide different time periods for completing each designated system. For example, one combination might contemplate bringing the primary system up to standard in 10 years, the secondary system in 15 years, and the tertiary system in 20 years. The program periods recommended for consideration by legislators and administrators would be predicated upon careful consideration of such factors as the nature, extent, and degree of the physical deficiencies noted and the fiscal ability of the responsible jurisdictions to correct them.

Scheduling the program

Although the question of the fiscal ability of the various levels of government to support the highways under their jurisdiction is probably the most basic one to be considered in preparing a schedule for a long-range highway improvement program, it is by no means the only one. The staff of the engineering needs study should receive advice from the staff of the financial needs study on the fiscal feasibility of any time period proposed for completing an improvement program. Other factors that must be considered in long-range program scheduling are the relative urgency of each major deficiency, stop-gap reconstruction that will be required if certain projects are deferred, and the effects of the inevitable time lag that occurs between the beginning of preliminary engineering and final completion of any construction project.

At this point the schedule is usually not translated into a detailed construction program for either a single year or short-term period of years. Although relative priorities of construction needs will have been determined for the more urgently needed improvements, it will usually be neither practical nor desirable to set up a detailed priority schedule of construction at this time.

Cost determination

The initial estimates of program costs of needed improvements and other related factors will be made on the basis of contracts let, force-account work done, or purchases made at the time of the physical needs determination. Whenever possible the cost determinations will be made in the field by personnel familiar with the work involved. However, they will be provided guides by the central office in the form of cost sheets showing contract, force account, and other unit cost data for similar current work.

Many elements of cost will need to be considered. For capital outlays these will include the purchase of rights-of-way and preliminary engineering as well as payments related directly to construction. Costs of an adequate level of maintenance, both during and after construction, must also be calculated. To these must be added appropriate allowances for administration and such other miscellaneous items (for example, State highway police) as are directly related to the highway function.

The length of the program period or periods for which calculations are to be made will have an important bearing on cost determination. Thus, a long-term program will require considerable "stopgap" repair or construction to keep roads not scheduled for reconstruction until late in the program in serviceable condition in the meantime. Also lower-grade roads built or reconstructed early in the program may need to be rebuilt before the program period ends. These and other factors not delineated here could add considerably to the *total* cost of an improvement program spread out over 20 or 30 years above that which would be incurred if the same level of improvement were to be reached in 10 years.

Pricing the program

The costs mentioned above will have been developed at price levels existing at the time of the physical needs study. For a relatively short-run program the effects of moderate upward or downward trends in prices will probably not be too severe to prevent the development of an adequate financing program, particularly if a considerable part of the construction is to be financed through borrowings. On the other hand, the use of current-level prices in estimating costs for a physical program to be completed over a 30-year period could be disastrous to the success of a financial program designed to support it if the value of the dollar declined considerably in the meantime, and if the relative cost of highway capital outlays and maintenance increased even more rapidly than prices in general.

It is beyond the scope of this article to discuss in detail or evaluate the various factors which are likely to influence future trends in the prices that will have to be paid for the equipment, materials, and services that will be required to build, maintain, and operate our highways. All that can be done here is to warn those who attempt to develop long-range highway finance programs that they must give due consideration to both trends in general price levels and those relating to highway costs if they are to plan adequately. If it can be assumed that the secular and cyclical trends of the recent past can be safely applied to the future program period, the problem of adjustment is not an insurmountable one even though separate and discrete indexes might need to be applied to various segments of the program—construction as contrasted to maintenance, for example.

LEGAL AND MANAGEMENT ASPECTS OF A LONG-RANGE HIGHWAY PLAN

To be completely successful in its application, a long-range highway program covering both the physical and financial aspects will also usually require some accompanying changes in basic highway law —perhaps even in the State constitution— and in the management of the highway function. However, the engineers and economists responsible for developing physical and financial highway programs have been almost without exception practical, hardheaded individuals, well aware of the difficulties inherent in any proposal calling for a major overhaul of existing legal provisions for and administrative management of the highway function. Consequently,

they have been loath to propose major changes in these areas unless such proposals were specifically requested or implied in the basic directives under which the studies were made, or would be unmistakably required to meet other provisions of such directives.

State constitutions sometimes stand as barriers to effective long-range highway planning. Frequently provisions that seemed eminently sound and desirable at the time of their adoption subsequently became straitjackets insofar as effective management of the highway function is concerned. State statutes often have the same effect, but as barriers to progress they are usually less formidable because of the greater ease with which they can be modified.

Areas in which constitutional or legal provisions most frequently hamper the management of the highway function are: Administrative classification of highways, including the addition of mileage to the State system; prohibition of borrowing to finance capital outlays for highways; rigid prescription of State highway department organization; prescription of formulas allocating proceeds from motor vehicle user taxes to local governments and among them, or diversion thereof to nonhighway purposes; limitation of salaries, from top-level posts in the State highway departments to county and city engineers; provisions governing the procurement of rights-of-way; licensing and regulation of motor vehicles and drivers; vehicle and traffic regulation; election rather than appointment of administrative officials requiring professional and technical training, such as county engineers; and the perpetuation of small local highway administrative units that cannot meet present-day needs efficiently.

Some shortcomings in the management of the highway function can be rectified administratively without legislative action. At the State level these may include reorganization of the highway department for more efficient operation; establishment of merit systems; elimination of political interference in the hiring and retention of employees; better coordination of highway department activities, as in planning and programming; and improvement of relationships with other governmental units, such as counties and cities. At the county level these may include the reorganization of the highway departments for more efficient operation, including the upgrading of some jobs and salaries to make them more attractive to professional engineers; consolidation (where permitted by law) of the highway activities small inefficient operations, such as townships or road districts, to obtain the benefits of better supervision and more efficient use of men and machines; voluntary cooperative action along similar lines between small counties, or between counties and incorporated places, to achieve the same benefits while preserving the autonomy of the individual units, and the installation of up-to-date procedures for planning and programing future work. Management improvements in city highway administration that can be installed without changes in the law will be generally similar to those that can be installed by counties, with differences more noticeable in degree than in kind, although the possibilities will differ considerably from one State to another.

It is encouraging to note that during recent years State highway departments, counties, and cities have become continuously more and more aware of their partnership and their need for cooperative action in the provision of a unified highway network adequate to serve the total needs of the State and the Nation. Much of this has come from the prodding of State legislatures and governors; some of it from new Federal-aid requirements added since the close of World War II; and, happily,

in some instances from farsighted voluntary action by highway administrators at all levels of government. At the State level these new concepts are reflected in the existence of staff-level positions that usually did not exist in 1945: "Engineer of county roads," "Engineer of Federal secondary roads," "engineer of city and cooperative projects," "secondary roads engineer," and "urban engineer"—to quote a few listed for various States. Similar positions, possibly not directly indicated by title, now exist in almost every State highway department. Technical associations, such as the National Association of County Officers and the National Association of County Engineers, are performing yeoman service in fostering better intergovernmental cooperation in highway matters.

The legal and management aspects of a comprehensive long-range highway plan should, perhaps, be studied by a separate staff or staffs because of the special skills required. In many instances, however, they have been handled as adjuncts to the physical or financial needs studies—generally the former. In any event, because of overlapping and interdependence of the studies, there cannot be a complete disassociation of these areas from the other two, or of the other two (engineering and financial) from each other.

Unless there is a clear directive to that effect, the recommendations of the highway law and management studies will usually not include the preparation of bills or constitutional amendments for enactment by the legislatures, although the adoption of so-called standard "uniform codes" or provisions thereof may be recommended.

FINANCING EXPANDED HIGHWAY PROGRAMS

The aim of the financial phase of a comprehensive long-range highway needs study is to develop and propose one or more schemes by which an adequate integrated highway network, such as may be recommended from the engineering-needs phase, can be financed fully and equitably. Unfortunately, this statement is deceptively simple and covers, if not a "multitude of sins," a multitude of activities, many of which are extremely complex, and their results controversial.

Content of the fiscal study

The suggested Public Roads outline for a complete report on a comprehensive highway needs study previously mentioned contains only one of its thirteen sections that deals exclusively with finance and taxation. However, there are at least nine others that are of some concern to those in charge of the finance and tax study; their connection with these other segments will range from full direct responsibility to mere receipt of information obtained, processed, and interpreted by others.

A review of the benchmark reports on comprehensive long-range highway taxation and finance studies will indicate that although the tables of contents differ to a considerable extent the variety of subjects treated will be remarkably consistent. Where separate reports are prepared on the physical and fiscal needs studies there will be sections of the two reports that largely duplicate each other but which will differ in direction and emphasis, and to some extent in coverage. Where a combined report is prepared, there will ordinarily be only a single discussion of each area of joint interest, but it will be broad enough to cover all elements of concern to the physical, fiscal, or administrative studies. The discussion that follows is oriented toward those elements that are important to the fiscal study without regard to the type of final report prepared.

Among essential preliminaries to the fiscal study are: (1) Development of a clear and concise statement of the objec-

tives and scope of the study, including indication of the authority under which it is being made and by whom; and (2) preparation of a detailed work program. The statement of objectives and scope will have many uses besides becoming a part of or a supplement to the project agreement or contract under which the study is conducted. The outline of work to be done—the "skeleton" of the work program—often becomes the outline for the project report.

Background material

People (where they live, what they do, and what their incomes are) and land (how much, what kinds, and how it is used) are the fundamental factors that determine and control the need for highway transportation. Therefore, it behooves the highway finance investigator to consider these things in the light of their bearing on the fiscal and tax aspects of any proposed highway program. In doing so he must not fail to give due consideration to not only the wishes of the public in such matters but also their financial ability to pay for what they want.

His counterparts in the physical needs and administrative studies should also be giving consideration to these areas, but from somewhat different points of view. To avoid duplication or omission of important items, and to assure agreement in interpretations, investigation of these sociological and economic factors should either be conducted cooperatively or concentrated under one staff or the other. Since the engineering needs study will be done primarily by engineers and the fiscal study primarily by economists and other social scientists, it would seem to make good sense to have the activity on this phase concentrated under the direction of the fiscal study staff, but circumstances prevailing in any given case will, of necessity, dictate the working arrangements to be adopted.

The text prepared as a result of these endeavors should trace the historical development of agriculture, commerce, and industry, and of rural and urban population distribution, up to the time of study. Special attention should be given to the relationship between these factors (including land use, by implication), plus wealth and income, on the overall demand for transportation of people and goods, and how the demand is being met. There should also be an appraisal of the adequacy, economy, and fitness of the various transportation media to meet these needs. However, the broad objectives of the highway needs study must be kept continuously in mind so that this phase of the project neither loses its direction nor bogs down from its own weight.

Vehicle ownership and use

Since motor vehicles are now the prime objects of taxation for support of the highway function, the number and types of vehicles in use, where they are owned, and how they are used have an all-important bearing on highway finance and taxation. However, similar information will also be required for the physical needs study, probably in even greater volume and detail, to measure construction and maintenance needs and develop the improvement program. In consequence, it has usually been the custom for the staff of the finance study to rely on the engineering study staff to provide most of the information needed in this area.

Different types of information will be required for various segments of the fiscal study. Thus, in determining the incidence of taxes on motor vehicle users it will be essential to know how many vehicles of various basic classes are owned in the State, where they are owned or domiciled, and how they are used. Estimates of these values will also be required for the duration of the improvement program. Information will also be needed about the number and

types of vehicles registered outside the State that use its highways, and how much. Each type of cost allocation study that is made will also require different types of data about vehicles and their use. It is essential, then, that the fiscal study staff carefully appraise its needs for such information at the earliest possible moment and advise the engineering study staff of these requirements immediately so that plans for collecting all of the vehicle and travel information required can be coordinated most effectively.

Economic forecasts

A long-range highway plan can be no better than the forecasts upon which it is based. Although the specific elements for which forecasts will be required will differ to some extent between the physical and fiscal needs studies, they will all relate to the same basic series: population—how many and where; income—what kinds and how much; motor vehicles—how many and where; vehicle travel—how much and where; and motor fuel consumption—how much, by what vehicles, and at what rates.

There have been numerous occasions where separate forecasts have been developed for and applied in the physical and fiscal studies. Unless the resulting differences are of small consequence this is highly undesirable because the use of divergent forecasts of the same item tends to confuse users of the findings and to discredit both studies. Consequently, the development of the forecasts basic to both studies should be a venture of both, or those made for the one should be accepted for the other. Since the fundamental factors for which forecasts are needed are demographic, sociological, and economic it is, perhaps, preferable for the fiscal study staff to take the lead in making these predictions.

The predictions made should cover at least the entire period of the longest "catch-up" program to be recommended. In preparing them due consideration should be given to all reliable benchmark data—such as the latest available Federal and State population censuses and population projections; forecasts made by other State agencies, such as planning commissions and vital statistics bureaus; and forecasts made by college and university bureaus of business research. However, where such sources do not appear to be in line with present informed and qualified judgment they should not be permitted to dictate the secular trends of forecasts adopted for the needs studies.

Historical review

If a given study is the first comprehensive project of its type to be undertaken in a State, a thorough and inclusive study of the history of highway development in the State and of highway financing will be required to provide background and basis for the fiscal recommendations to be made. However, if the subject study is a sequel to an earlier one the historical review required will be much less lengthy and detailed, and can be largely composed of summaries of, references to, and supplements to the material compiled for the earlier study.

Many of the factors to be covered in the historical review will be required for the physical needs and administrative studies as well. These will include the growth of highway mileage and systems, development of the present setup for administering the highway function, and growth of the investment in highways. To these will need to be added the areas of primary interest to the fiscal study: development of present structure of financial support from the standpoints of adequacy, equity, and productivity; the nature, extent, and experience of the State and its subdivisions in borrowing to finance highway activities; and any experience that the State or its

subordinate units may have had in toll-facility financing. Careful consideration must also be given to intergovernmental relationships in highway management and financing, and their effects on the establishment and operation of an efficient highway network.

Highways and public finance

Although the provision of highways possesses many of the attributes of a public utility enterprise, the highway function is still a prime function of government and as such must be studied against the background of other government activities. This is especially true in the case of States whose economic bases—and consequently their ability to support all functions of government—are relatively limited.

It is sometimes far from easy to make satisfactory comparisons. Some functions of government are more concentrated at the State or local levels than others; thus, in many States public expenditures for higher education are largely concentrated at the State level, while those for elementary and high schools are concentrated at either the local or county level or shared between them. For purposes of meaningful comparison with highway expenditures it becomes necessary to place all of them on a common base. A further complication arises because of the various systems used for intergovernmental spreading of such burdens; tax-sharing, aid payments, and joint support of various activities, to name a few.

The differences in tax incidence and per capita expenditures between rural and urban areas also produce problems in making comparisons. Where the differences are considerable, consolidated comparisons on a Statewide basis become relatively meaningless.

In spite of all these difficulties, and the lack of any known technique for quantitatively determining the appropriate levels of public expenditures, there is great value in attempting to measure them and, if possible, comparing them with the fiscal ability of the tax base to support them. Such calculations are vital to determining what kind of highway improvement program can be supported, and at what rate of accomplishment. Comparisons with other States may be helpful in this respect.

Comparisons with other states

No two States are exactly alike and so are not fully comparable. Nevertheless, the question continually arises, "How are we doing in comparison with our neighboring States?" In spite of the difficulties of making comparisons among States there are worthwhile benefits to be gained from them, and long-range highway planners should not fail to make those that will be most meaningful.

For most purposes the best comparisons can probably be made with States most similarly situated to the State in question. Characteristics that would rank high in deciding whether comparisons would be worthwhile would be: Proximity; physical geography; population density; rural-urban distribution of population; agriculture-industry-commerce relationships; per capita income; governmental structure; density of motor vehicle ownership; highway income; expenditures and debt per capita—for all highways combined, and for each system; expenditures per mile of highway, total and by systems; State and local motor vehicle user imposts per vehicle and per capita; total State and local taxes and debt per capita and per unit of personal income. For any given situation there would assuredly be other comparisons that could be made to good advantage.

Comparisons made for the fiscal study in any of the areas listed above or others could, in many instances, be supplemented to good advantage by comparisons with other States made for the engineering needs

study. These could be used to demonstrate such points as the level of the effort being made to support the highway function, and the relative potential ability of the various States to do so.

Comparisons among States must not be taken too seriously but they have considerable value as indicators, especially for those States where the highway finance and taxation problems are most severe. A fiscal problem that appears to be insurmountable often loses much of its awesomeness when comparisons are made with other States similarly situated.

Allocation of highway costs

A comprehensive long-range highway finance study should perforce include a cost-allocation analysis to insure that the expanded program will be financed equitably as well as adequately. Although the existing tax structure may be found to be reasonably equitable in all aspects, it is as essential that this fact be established as it is to demonstrate that a structure generally regarded as being inequitable is inequitable in fact.

Unfortunately, there is no universally accepted formula for allocating highway costs among either motor vehicle users and others, or among classes of motor vehicle users. Therefore, it has been generally recommended by specialists in motor vehicle user tax analysis that those in charge of highway finance studies make allocations according to at least two differing philosophies under each of the two areas of allocation mentioned above. The approaches used, however, should be at least generally acceptable to the investigators. Those to whom the responsibility of making motor-vehicle-user tax policy falls will then have alternative solutions from which to choose, solutions which will probably differ in degree rather than in kind.

The long-range fiscal program

As already indicated, it is the responsibility of the engineering needs study not only to provide the physical measure of the engineering program—so many miles of a certain type of road and so many bridges, for example—but also, to price the program. Unless there is a dictate to the contrary, the period or periods proposed for completion of the improvement program will already have been mutually agreed upon between the physical- and fiscal-study staffs before any final pronouncement of the engineering program is made. This will guarantee that the physical program or programs proposed are such as can be financed practically within the fiscal ability of the jurisdictions involved, providing they are willing to do so.

The fiscal study staff will ordinarily be expected to make certain recommendations for financing the program or programs. First, these recommendations must provide *adequate* financing. This will involve, in many instances, a deliberate choice between so-called "pay-as-you-go" financing —usually requiring temporary increases in present highway user tax rates, or the exploitation of new tax sources—or credit financing to be paid back later with incomes from taxes—with interest, of course.

Concomitant with the preceding activity will usually be a determination of *sources* of revenue to be relied upon to finance the highway function. The cost allocation studies will provide general guides as to types of revenue sources to be relied upon —so much from motor vehicle user imposts and so much from property taxes or general revenues—but will not indicate precisely what types of imposts should be depended upon to provide the needed funds. This problem becomes especially acute if the proposed highway network involves several administrative road systems, each under different supervision.

If the engineering or administrative study

proposes a realignment of responsibility for highway administration that increases the burden upon one class of governmental units and decreases it upon another, this will usually require an accompanying *realignment* of fiscal support, involving, perhaps, development of new sources of revenue, or the payment of aids or shared taxes—or some form of joint responsibility. In any such case it will be up to the fiscal study staff to devise and propose a scheme of financial support for the new alignment.

Finally, the combined *impact* of whatever financial plan or measures are to be recommended upon the various user and nonuser groups causing the highway costs or benefiting from them must be as fair and equitable as it is possible to make them. This is perhaps the most difficult phase of the entire study, but it is certainly one of the most important.

Prosecution of the fiscal study

Enough has been said to indicate clearly that the physical, fiscal, and management studies need to be geared together from start to finish if the end products—the long-range engineering program and fiscal and management plans—are to be most effective. For that reason, the individual study staffs should be organized and set to work at about the same time. This will permit complete cooperation and understanding in planning the work program, and developing the background material and forecasts needed for the individual studies.

Then, while the engineering study staff is making the physical needs estimates the fiscal study staff can be compiling the necessary historical and current fiscal data that will subsequently enable it to plan satisfactory financial and tax programs. During this period the fiscal study staff can also be working with the other staffs on changes in present arrangements that will be required if highway system reclassification or major management changes are contemplated as a result of the other studies.

During this period predictions of future incomes that may be expected from present tax sources may also be made, preparatory to development of the long-range fiscal program. The possibilities of tapping new tax sources may also be given study at this time, along with the possibilities of doing away with present sources of income for highways that are inequitable, undependable, or otherwise unsatisfactory. The tax-allocation studies can also be started.

Of primary importance to the prosecution of the fiscal study is, of course, receipt as soon as possible of the completed engineering needs program, and of recommendations for management innovations. When these determinations have been made the physical needs and management study staffs can begin to put their project reports in final shape. Not so, the fiscal study staff. Only then can development of the financial program be begun—a very complex operation at best, and one which may be fraught with many trying weeks of trial and error before a workable scheme or schemes can be devised. Thereafter will come completion of the fiscal study report. All of this activity may require as much as three months; to require that the fiscal study report be ready when the reports on the engineering and management study reports are completed is hardly realistic, but such is often stipulated.

A truly comprehensive long-range highway planning project for most States will require at least from 15 to 18 months for completion if a really thorough job is to be done. However, such a time schedule will not provide for collection and analysis of all the basic information—such as traffic-study or motor-vehicle-use study data—that will be required for such fiscal-study essentials as the cost-allocation investigations, and which are frequently not at hand

when the project is started. Unfortunately, the prescriptions under which long-range highway planning studies are made usually fail to allow adequate time for proper completion. As a result, the studies suffer in thoroughness and completeness.

Under ordinary circumstances the fiscal study staff cannot be either sufficiently large or inclusive as to skills to compile and analyze all of the basic information that must be considered in arriving at its conclusions. Consequently, it must rely upon others to do much of this spade work for it. The best single source of such support will undoubtedly be the highway planning organization in the State highway department. Each highway department has one, and it will have been collecting and compiling data fundamental to highway planning for from 20 to 25 years. Other sources of information that will generally prove productive are other State agencies, especially those dealing with economic and financial statistics; county and city governments; college and university business and governmental research bureaus; municipal associations, and Federal government agencies, such as the Census Bureau and other constituents of the Department of Commerce. The Bureau of Public Roads, usually acting through the State highway department, is always ready to provide technical assistance and advice to those making long-range highway needs studies.

Good public relations are essential to a successful fiscal needs study. These must extend not only to the sponsoring committee or agency and to the sources, governmental and otherwise, from which information and cooperation is sought, but also to the general public, including those associations and other groups that may be expected eventually to oppose some of the fiscal study recommendations. In most instances the sponsoring committee or the State highway department will hold a series of public hearings as the study progresses to acquaint the public with what is being done and the progress being made, and to receive suggestions from the public. Customarily the fiscal study staff will be invited or directed to attend and participate in these hearings, but, if not, representatives should attend as observers if possible.

SOME PERPLEXING PROBLEMS

It often appears that there are no simple problems in highway finance. Nearly everyone favors or at least recognizes the need for better and more adequate highways, but when matters relating to how these highways are to be financed are up for consideration many erstwhile supporters of expanded highway programs qualify their support with the contention that since their assessments for highways and highway services are already too high someone else will have to bear the financial burdens of the expanded program. Unfortunately, no system of financing highways (or any other governmental function, for that matter) has yet been devised that is painless, and he who seeks a solution to the problems of highway finance must proceed with the knowledge that no matter what his recommendations may be they are certain to arouse opposition somewhere. This situation adds troublesome practical hurdles to a course that is already beset with a host of theoretical ones.

Problems relating to public finance theory

Within recent years the question of whether or not the income from imposts levied against highway users as such should be reserved for highway purposes or paid into the general fund has become largely academic at the Federal and State levels, at least. Passage of the Federal Highway Revenue Act of 1956 brought about creation of the Highway Trust Fund to which the receipts of certain Federal imposts on highway users were to be credited, and

from which most Federal expenditures for highway purposes were to be financed.[16] This action brought Federal financing of highways into line for the first time with the "antidiversion" policy applied to highway financing by the States, as first set forth in the Hayden-Cartwright Act of 1934.[17] Of the 50 States only 4 (Delaware, New Jersey, New York, and Rhode Island) now follow the practice of placing all the revenues from their imposts on highway users in their general funds, although partial "diversions" of such income still occur to a greater or less degree in nearly half of the States.[18]

The reservation of income from highway user imposts for highway purposes has been a tremendous boon to the long-range planning and programming of highway improvements, and adequate maintenance and reconstruction of the highway plant. Many authorities believe that without it our present highly integrated nationwide network of major highways, remarkably uniform in coverage and quality, would have been impossible of attainment, and that the high level of technical competence and efficiency found in nearly all of our State highway departments today could not have been achieved. However, with increasing pressures being brought on the States for raising levels of expenditures for some functions and making new types of expenditures in other areas—urban renewal and mass transit, for example—it is likely that increasing efforts will be made to tap the income accruing from State imposts on motor vehicle users for other than "highway" purposes as now recognized.

A concept that has gained acceptance in some areas is that the highway function should no longer be treated as an ordinary governmental function, but rather as a governmental enterprise or public utility. If carried to its extreme interpretation, this philosophy would result in the total support of all highway activities from charges on users, some of which undoubtedly would be assessed on the basis of "potential" service available and the remainder on the basis of "actual" service rendered. Although the public utility concept has not yet been formally adopted by any State, several States in which complete financial responsibility for all or nearly all rural roads has been placed upon highway-user tax sources and Federal aid have come close to recognizing it in fact.

The public-utility nature of the service rendered by primary highways—especially limited-access facilities—is readily recognizable. However, in the case of roads and streets that render access service to property alone, it is much more difficult to recognize, and adoption of the utility concept would appear to become rather farfetched. The right of access to land has been recognized as fundamental since early times, and the responsibility of government (usually at the local level) to provide and protect it was universally accepted even in colonial days. In addition, government today has many other interests in the provision of highway facilities at all levels; facilitation of national defense and internal police protection, fire protection, promotion of public health and safety, conservation and cultivation of national resources, facilitation of better educational opportunities, and promotion of internal and external commerce are examples. Con-

[16] 70 Stat. 374, Sec. 209.

[17] Title 23, United States Code, Section 126.

[18] According to the Bureau of Public Roads, disposition of receipts from State imposts on highway users for nonhighway purposes during 1959 amounted to $450 million, of which $132 million occurred in the four "general fund" States. However, the Bureau is careful to qualify its tabulation with the statement that, "The amounts shown do not necessarily constitute diversion from highway use requiring a penalty under the Hayden-Cartwright Act of 1934." The total amount used for nonhighway purposes was about 9 percent of total receipts from State imposts on highway users in 1959. See table DF, page 37, **Highway Statistics 1959**, published by the U. S. Bureau of Public Roads.

sequently, most students of highway finance today agree that although the provision of highways now has many public-utility aspects it is still, nontheless, a primary function of government and should be financed as such.

The power to tax brings with it many corollary powers—to promote, to restrict or regulate, to penalize, or even to destroy. The first highway-user taxes imposed by the States—vehicle registration charges—were levied initially for purposes of the regulation and control of motor vehicles. Soon, as the number of motor vehicles in service and the extent of their use continued to increase rapidly, the possibilities of motor vehicles user taxes as prime revenue-producers became evident, and soon the emphasis was almost exclusively on this aspect. At present, although there is still a considerable element of regulation involved in the imposition of registration taxes and fees and related charges (such as operator license fees), the primary aim of State-imposed vehicle-registration and motor-fuel taxation is the production of revenue for highway purposes.

In the area of carrier taxation the situation is not so clear-cut. Most of the States impose some form of regulation on various types of carriers and perform or at least finance a part of this activity through taxation. In the case of highway carriers, this activity has become intermixed with highway user taxation to the extent that regulatory aspects are found not only in the so-called carrier taxes, but also even in the registration-tax structure. As a result, it is sometimes difficult, if not impossible, to separate the regulatory and user-tax elements in the structure of State motor-vehicle user taxation.

With few exceptions highway taxation specialists not affiliated with one or another of the affected interest groups will agree on two fundamental principles in this area: (1) that regulatory and highway-user taxation should be disassociated, or at least completely separable; and (2) that highway user taxation as such should be completely neutral among modes of transportation on the one hand and among classes or types of highway users (or vehicles) on the other. With application of these principles the highway-finance planner can disassociate himself from the regulatory aspects of taxation of highway users and concentrate entirely on the highway-user aspects. Presumably, then, he would be concerned only that, for the same amount of benefit received or cost incurred, two different highway users should bear the same amount of highway user tax regardless of the type of service rendered (e.g., private or for-hire) or fuel used.

Allocation of highway costs

"Equity" in highway taxation means different things to different people, depending upon their points of view. If for any given study highway tax questions can be considered from a strictly neutral point of view much, but by no means all, of the confusion and bickering can be eliminated. The question at issue then becomes one of assigning equitable financial burdens for the support of highways among all groups of beneficiaries in proportion to benefits received, costs occasioned, or some other reasonable measure. However, difficulties inherent in accurately measuring benefits received or costs created give host to seemingly interminable controversy. The problem of cost allocation, then, becomes probably the most difficult facing most highway-finance planners.

Voluminous studies have been made of the allocation of highway costs, and much theoretical discussion has been recorded on the subject. One of the most authoritative and enlightening capsulized discussions of the problem was presented by G. P. St. Clair before the Twenty-Seventh Annual Meeting of the Highway Research Board

in 1947.[19] Some "new" approaches to the problem of cost allocation have been developed since that paper was written, but it still remains a classic in its field. Others who have made significant contributions to the theoretical literature on highway cost allocation include Charles L. Dearing, James C. Nelson, Richard M. Zettel, O. H. Brownlee, and Walter W. Heller.[20]

Several important studies of highway cost allocation at the nationwide level have been made during the last three decades, several by agencies of the Federal Government and the remainder by private consultants or other agencies for various interest groups.[21] The most recent study in this series, and one of the most comprehensive, was the Highway Cost Allocation Study, made by the Bureau of Public Roads with the assistance of the State highway departments and others, pursuant to a requirement of Section 210 of the Federal Highway Revenue Act of 1956. The "Final Report" on this study, although not covering all phases, contains excellent discussions of the fundamental issues involved besides describing in detail several of the allocation procedures employed, and comparing the findings of other investigators.[22]

The number of cost-allocation studies made at the State level—nearly all of them in connection with highway needs studies—is considerable. References to the reports published on most of these will be found in the Final Report on the Highway Cost Allocation Study, or in various other publications cited earlier in this article. However, reports on several State studies have been issued since the Highway Cost Allocation Study went to press. These include especially noteworthy reports on studies completed during 1960, in Iowa, Maine, and Missouri.[23]

With all the ramifications of "phantom interest," "property tax equivalents," "pricing," and other impedimenta stripped away, the fundamental elements of the problem of equity in highway tax allocation are two: (1) The assignment of just proportions of the burden among the major groups of beneficiaries from highways and highway services; and (2) the assignment of just proportions of the motor-vehicle-user responsibility among vehicles

[19] "Suggested Approaches to the Problems of Highway Taxation." In **Proceedings, Twenty-Seventh Annual Meeting, 1947,** Highway Research Board, Washington, D. C. pp. 1-6.

[20] See, for example:
"American Highway Policy," Charles L. Dearing, The Brookings Institution, Washington, D. C., 1941.
"Objectives and Concepts of Highway-User Taxation," Richard M. Zettel, in **Bulletin No. 92,** "Highway User Taxation," Highway Research Board, Washington, D. C., 1954, pp. 1-14.
"Highway Benefits and the Cost Allocation Problem," Richard M. Zettel, **Committee Proceedings,** American Association of State Highway Officials, 1957.
"Highway Development in Financing," O. H. Brownlee and Walter W. Heller. In **American Economic Review,** May 1956.

[21] Among the most noteworthy reports in this group are:
"Highway Costs." A report to the Association of American Railroads in 1939 by C. B. Breed, Clifford Older, and W. S. Downs.
"Regulation and Taxation of Highway Transportation." Joint Committee of Railroads and Highway Users. January 1933.
"Public Aids to Transportation: Volume IV, Public Aids to Motor Vehicle Transportation," Federal Coordinator of Transportation, Washington, D. C. 1940.
"Public Aids to Domestic Transportation," Board of Investigation and Research. House Document No. 159, 79th Congress, First Session, Washington, D. C., 1944.

[22] "Final Report of the Highway Cost Allocation Study." House Documents Nos. 54 and 72, 87th Congress, First Session, Washington, D. C., 1961.

[23] See:
"Financing Iowa's Highways—A Fiscal Study Report to the Iowa Road Study Committee, 1960." Prepared by Public Administration Service, Chicago, November, 1960.
"Maine Highway-User Tax Study." Prepared by Wilbur Smith and Associates, New Haven, Connecticut, November 1960.
"Financing Missouri's Road Needs." Prepared by Bureau of Business and Economic Research (now the Research Center, School of Business and Public Administration) University of Missouri, Columbia, December 1960.

of different types, sizes, and classes of use. Traditionally, it has been assumed that benefits from highways accrue to three groups of beneficiaries—the property directly served, the motor vehicle users, and the general public or "community." In recent years this traditional approach has been challenged by those who contend that, with minor exceptions, in the United States of America today, all benefits from highways are received directly or indirectly through motor vehicle use. To this the "classicists" reply that, granted that this is true, motor vehicle use merely becomes the channel through which the benefits are received, and that this does not in any sense change the fundamental character of these benefits. To most recent investigators this argument has appeared relatively academic, and has not noticeably affected either their methods or their findings.

The greatest contention arises because of our inability to measure either highway benefits received or costs occasioned to the satisfaction of all parties concerned, and at present there seems to be no hope for the early development of a completely accurate and foolproof procedure for making these determinations. Consequently, each investigator will do well, if he has a freedom of choice, to study what others have done before beginning his own calculations, and then choose at least two plans of attack on each of the fundamental elements listed above so that whatever recommendations he may make will be based upon the broadest possible foundation of fact and inference.

Distribution of highway funds

Philosophies and patterns of highway fund distribution are well-established in nearly every State, and are closely linked to the existing division of administrative responsibility for the highway network. Any recommendation for a major departure from the established arrangement is certain to encounter strong opposition in some quarters, but a thorough-going finance and tax study almost assuredly will indicate the need for some revision.

Highway needs investigators will do well to consider all the "pros" and "cons" carefully before recommending large-scale revisions in either the pattern of highway administration or of highway finance, and any changes proposed should be reasonable and clearly substantiated by the facts. It should be remembered that intergovernmental participation in highway activities at various levels not only brings intergovernmental controls (often frowned upon), but also brings a higher degree of intergovernmental concern about and participation in the creation and operation of a truly integrated highway network—a major aim of the long-range highway planner.

Some groups contend that the expenditure of highway-user tax revenues should be restricted to the primary road systems which were created primarily for the user's benefit, while others contend that since nearly all use of the highways is now made by motor vehicles, vehicle users should pay the entire highway bill. Neither contender appears to be on completely firm ground. Most of the generally recognized hypotheses for the allocation of highway costs between highway users and others will assign at least a modicum of nonuser responsibility to even expressway facilities on the one hand, and an appreciable amount of user responsibility to land-service roads and streets.

In developing a financial program to be recommended on the basis of such findings the investigator has several alternatives. Because of prevailing philosophies and procedures he can sometimes disregard indications of minimal nonuser or user tax responsibility on the systems of greatest and least traffic importance, respectively. On the other hand, he may find it necessary to recommend a scheme of "upstream"

and "downstream" aids or other financial participation in the support of all highway systems. A third alternative, probably the most reasonable in the majority of cases, is to eliminate joint participation in the support of one or more systems through a balancing of "debits" and "credits," as is inherent in the "earnings credit" method of highway cost allocation.

Whatever approach is used, some form of tax sharing, aid payment, or other joint participation among levels of government is almost certain to be found desirable. To insure a reasonably favorable reception the recommendations made should depart no further from the existing fiscal structure than circumstances warrant, but there should be no reluctance to recommend major revisions if such a course is clearly indicated.

The simplest formula for the allocation of shared taxes or aids is not always the best, but it is usually the easiest to get accepted by legislatures and other parties concerned. In devising formulas for such allocations, long-range highway planners should seek the simplest prescriptions that would place the funds to be allocated as consistently as possible with the findings of the cost allocation studies. To insure that these funds will be spent in a manner that will not do violence to the hypotheses involved in their allocation, some controls over their expenditure by the expending agency should be provided.

Pay now or pay later

Talk of a "pay-as-you-go" highway program is usually imprecise because what is commonly referred to is a program which is financed on a "pay-before-you-go" basis. In other words, the money to finance the program must be on hand from current income sources—not from borrowings—before the bills come in. Such a financial program is ultraconservative, and it can prove entirely satisfactory for financing a continuing program of reconstruction, maintenance, and operation once the initial backlog of accumulated construction needs has been overcome.

If it is prescribed, however, that a long-range program for overcoming accumulated needs is to be overcome on a "pay-as-you-go" basis, the highway planner is usually in serious difficulty. He is faced with two alternatives—to seek "temporary" increases in taxes sufficient to finance a short-run high-level construction program, or to propose a "stretched out" construction program that can be financed with only small increases in taxes or none at all. On the one hand, he will be beset by the anguished complaints of those whose taxes will be raised; while on the other, he will face the double-barrelled problem of long-continued highway inadequacy in any case, and the possibility that the improvement program may have to be stretched out beyond the normal life expectancy of certain elements, with the result that adequacy in these elements can never be achieved.

Constitutional or statutory provisions in some States are such as to rule out, effectively, direct large-scale borrowings for highway improvements. Under such circumstances the highway planner must either content himself with a program that can be financed on a "pay-as-you-go" basis, propose revision of the law, or attempt to devise some method of circumventing it. The latter course it not entirely reprehensible by any means, and has been "standard operating practice" in a number of States for many years. Nevertheless, this approach is fundamentally undesirable for many reasons.

Methods of legally circumventing such provisions have included resort to obtaining advances of funds to the States from subordinate units that could borrow (to be repaid later as tax revenues became available); the issuance and reissuance of short-term obligations, such as notes and

certificates; and the creation of "authorities" or other quasi-public bodies that could borrow funds to build highway facilities, with the borrowings usually being repaid from the proceeds from tolls imposed for their use.

Financing capital outlays through borrowing is often criticized as costly, but in practice this method may prove to be the cheapest in the long run. Thus, the real cost of land, which is becoming an increasingly larger factor in the cost of new highways, is steadily increasing and can be expected to increase as our population grows and the supply of land remains fixed. Also, continuation of the inflationary long-term trend that has been in evidence since Colonial days may well be responsible for future increases in price levels that may more than offset the interest cost of funds borrowed now. Furthermore, the economic costs to the public from having inadequate highways—increased costs of vehicle operation under congested conditions and costs of accidents on antiquated highways, to cite two elements—may in the end be much greater than would the costs incurred if sufficient funds could be borrowed now to finance the needed highway program. Unfortunately, the highway planner often finds it extremely difficult to convince the skeptics of the validity of these arguments.

Developments during the past two decades have demonstrated that toll facilities can play a part in the creation of a modern highway plant. Whether such financing can under any circumstances be most economical is, however, debatable, and it is a foregone conclusion that toll financing could never be relied upon to provide all the highway facilities the public requires. The toll facilities now in operation fall primarily into two classes: (1) those that provide an essential service that is too expensive to provide and maintain with funds otherwise available (toll ferries, bridges, and tunnels are characteristic of this group), and (2) those that provide and "express" type of service at "extra-fare" rates to the users. Long-range planners must keep all of the characteristics mentioned above and others clearly in mind if they are considering recommending any programs involving reliance on toll financing.

Fiscal ability

Two factors finally determine how much or what type of a highway program a given State or community can have: (1) The extent of its fiscal ability or resources, and (2) the amount of these resources it is willing to devote to this activity.

Each of us as individuals has only a limited discernible amount of fiscal ability from which payments must be made for such diversified purposes as housing, clothing, food, education, medical bills, transportation, and savings. Each of us has some discretion in how he will spend his money, although the demands of taxes and other necessary expenditures sometimes drastically limit this freedom.

A similar situation applies to governments. The fiscal ability or resources of a government are circumscribed by the magnitude of its tax base, and the willingness of its taxpayers to contribute to its support. Against this inherent capacity come claims for all the various functions it must finance. Its fiscal problems are complicated and magnified because it must often compete with other governments for the resources of the same tax base, and it is always competing with other governments for the resources of the ultimate taxpayer.

In the past, long-range highway planners have not been unmindful of the fundamental problems created by limitations on fiscal ability, but, because of a lack of precise knowledge of the subject and of adequate tools to deal with it, they have been forced either to ignore it in their final analyses or, at best, to treat it only in the most general terms. Public finance economists are be-

coming increasingly concerned about the matter, and it is to be hoped that this concern will lead eventually to the development of tangible solutions. When the "breakthrough" occurs, long-range highway planners should be prepared to take full advantage of it.[24]

FROM PLANS INTO ACCOMPLISHMENTS

It must never be assumed that once a comprehensive highway needs study has been completed it will mark the end of all activity along that line. Nothing can be further from the truth, because long-range planning for highways is a never-ending activity. Once the engineering needs program is translated into construction projects which are let to contract, and into maintenance activities, it becomes necessary to make periodic reexaminations to see how the program is progressing. The same is true of the programs of financial support adopted as a result of the fiscal study.

Since ours is a dynamic society, conditions can change almost overnight that will render even the most carefully and scientifically prepared forecast inaccurate and engineering and fiscal programs inadequate or ineffective. Past experience in those States that have had not one but several more or less comprehensive needs studies has indicated that a major reappraisal in both the physical and fiscal fields is desirable periodically, possibly at intervals of from three to five years, while a large-scale comprehensive reevaluation will become desirable every five to ten years, depending upon the circumstances.

Furthermore, it can never be assumed that simply because a comprehensive long-range highway needs and finance study has been completed the findings thereof will be translated immediately into appropriate action. In fact, among the studies that have been made since the close of World War II there are only a few instances where anything approaching the complete program has been enacted into law, or adopted by administrative directive where such was all that was required. In a few instances the immediate results have been almost the opposite of what the planners recommended.

Experience has demonstrated, however, that the immediate results, unfavorable as they may seem, do not mean that the study in itself was unavailing. Some recommendations that are most obvious, and where little or no controversy is involved, are almost sure to be adopted within a period of a few years, while others, usually requiring more of a departure from past procedures or involving controversial areas, are likely to be much slower of adoption either in whole or in part. It can be expected to require at least three to five years before the final results of a comprehensive highway needs study can be measured, and even beyond that period a few of the seeds sown will often be found to take root and eventually bear fruit.

The portions of the comprehensive study most likely to be accepted will be those dealing with the nature and magnitude of the physical improvement needs of the various highways systems, especially the State primary system, and the estimated costs of making these improvements and of operating the completed highway network. Less likely to be accepted are recommendations concerning a reclassification of highways into administrative systems, especially where this will involve major management changes such as taking away the highway responsibility from some local units. Recommendations concerning exten-

[24] For a recent interesting discussion of the subject, see "The Fiscal Capacity of the States," by Selma J. Mushkin in **Proceedings of Fifty-First Annual Conference, 1958,** of the National Tax Association, published by the Association in 1959. pp. 297-306.

sive revision of highway laws will usually have been made only where there is a clearly demonstrated inadequacy, but acceptance of such recommendations, however, is very difficult to predict.

In general, all of the findings of the finance and tax studies may be expected to fall into the controversial area. Suggestions concerning increases in existing tax rates can always be expected to arouse strenuous opposition, but the findings of cost-allocation studies, which indicate either that certain groups of those causing the costs or those benefiting from highway expenditures should pay appreciably more taxes than under the present taxing structure, or be assessed new taxes (such as the so-called "third-structure" taxes), are certain to provoke major battles.

A detailed discussion of the translation of long-range engineering plans into action and eventual accomplishment is beyond the scope of this article, but some knowledge of the steps that must follow completion of the initial long-range plan is essential to an understanding of practical highway planning. The report of the engineering needs study will frequently be rather specific in indicating which segments of the primary highways are in need of major improvement, but it is not likely to spell out specific projects to be accomplished each year, although indications of the total amount of work that should be accomplished in succeeding specific periods may be frequently given. An example of a typical project report is the Missouri report, "Highway Facts in Missouri," recently prepared by the Automotive Safety Foundation for the Missouri State Highway Commission at the request of the Joint Legislative Committee on Roads, Streets, and Highways of the Missouri General Assembly.[25] The project report will customarily be supported by files of detailed worksheets which will list the needs of the State primary system, section by section, and estimates of the cost of correcting them. In the Missouri study as in many other recent ones, the field data sheets were priority-rated as an aid to future programming of improvement projects.

Once the overall physical improvement plan is adopted, it is then necessary to translate it into an improvement program to be put into effect on a year-by-year basis. This is where the so-called "programming" activity begins. Highway administrators will select projects which they believe to be most critical of a dollar magnitude that can, in their opinion, be financed during the next one, two, three, or more years. Once the program is officially adopted by the highway commission or other responsible official or officials, it is translated into directives for preliminary and final location surveys, rights-of-way acquisition, design and plans preparation, and, eventually, to construction.

Thus, the activity known as programming is the logical and necessary sequel to planning, and must occur in some form or other before the plans can be translated into accomplishment. In actuality there may be several programs in the programming stage rather than one; for example, there might be one program for the accomplishment of preliminary surveys, another for the purchase of rights-of-way, a third for the preparation of plans, and a fourth to schedule the individual projects for contract letting. It is easy to see that the process of programming is in no means simple, but is actually in many ways as complex as the procedure for physical or engineering-needs planning.

The physical programs must, of course, be translated eventually into financial programs. The extent of funds available for all purposes—such as administration and maintenance as well as capital outlays—

[25] Op. cit., pages 33-46. Jefferson City, Missouri, December 1960.

will place an effective limit on the size of the construction program that can be put under contract in any given year. The amount of funds available will be determined not only by current income from highway user taxes, Federal-aid, and other current sources, but also by funds received from borrowings. The fiscal programming, not ordinarily designated by that name, is usually handled by the top-level administrative heads of the State, county, and local agencies involved unless there is some specific directive to the contrary imposed by the legislature or some other outside source.

Restrictions imposed from without can have a very important and sometimes a very adverse effect on both the physical and fiscal programs of a State highway department or other governmental agency responsible for the highway function. In this category would be included requirements that funds be distributed according to certain formulas among various construction districts, among systems, or even to specific projects. Such restrictions take much of the direction of highway development out of the hands of the highway administrators and places it in those of other groups, usually politically dominated.

In spite of all of the frustrations and shortcomings that have been recounted here, the field of long-range highway planning stands out as one of the most successful areas of the practical application of planning techniques that can be found in this country today. The excellent cooperative relationships that have now existed for more than forty years between the Federal and State governments in this area; those of a similar character that have existed for many years between most of the States and their subordinate units; and an active continuing program of collection, compilation, and analyses of data fundamental to long-range planning by the Federal, State and many of the local governments have gone a long way toward making these accomplishments possible. Those engineers, economists, and other specialists who have participated in long-range planning studies in the various States have themselves made a great contribution in this endeavor. As stated at the beginning of this article, highway planners are perhaps most fortunate among all planners since most of them live to see at least a portion of their dreams become realities.

Agriculture Needs Better Public Relations

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American agriculture has become public relations conscious, as an industry, only in recent years. For many decades agricultural producers and processors have aggressively merchandised individual farm products or groups of products, but just recently have they felt the need to *merchandise agriculture.* We now seek consumer acceptance not alone of our *product,* but of our *policy.*

It is well to consider this important problem because agriculture's public relations with vast numbers of the non-agricultural population are not in good repair.

This discussion will cover five general areas.

1. **The development of the agricultural public relations problem.**
2. **Bases for the hostile urban attitude toward agriculture.**
3. **Facts and fancies underlying urban attitudes toward agriculture.**
4. **Current situations and attitudes which are dangerous.**
5. **What can be done about it.**

Nature of public relations problems

Throughout U. S. national history, agriculture has always "enjoyed" the sympathy of most non-farmers. Our industry has always been able to draw upon a substantial deposit in the bank of national good will. The balance in that account is still large, but has been decreasing in recent years.

The historical solicitude for agriculture is understandable. Until just a generation or two ago we were essentially an agricultural nation. Most of us are at the most only one or two generations removed from active farming. That is true of vast numbers or urban families.

There are other reasons why, as a nation, we have been uniquely sympathetic with farmers. Even those who live in the densest part of big cities recognize that food production is basic and vital. They have been slow to attack those who supply their food.

Through the years, non-farm people have been "sympathetic" with farmers because of their long hours of hard work, lack of city conveniences, and relative isolation from the cultural and recreational facilities of the city. Farmers are subject to weather and insect hazards, to price and income differentials as compared to other vocational groups, and have often struggled under the burden of heavy indebtedness while trying to pay for the farm they operated. Moreover, there has been a widespread belief in this country that a high proportion

of farm owners contributes to economic and political stability.

Most people in this country have traditionally thought of the farmer as a "little guy," and we don't get hard-boiled with little guys. Indeed, we give them preferential treatment.

This historical public sympathy toward farmers has found concrete expression in a long series of preferential legislative enactments.

Through the first two-thirds of the nineteenth century, disposition of the public domain was marked by easy land and credit policies. This finally culminated in the Homestead Act of 1862.

In the same year, the Lincoln administration adopted the Morrill Act creating special agricultural research and educational institutions in our states, and also created the United States Department of Agriculture.

The agricultural experiment stations were established in 1887, providing for a vast amount of scientific research at public expense for the agricultural industry. The Smith-Lever Act in 1914 established the cooperative extension service, under which scientific investigations and recommendations are carried to farmers—at public expense. The Smith-Hughes Act in 1917 provided for teaching of vocational agriculture in high schools. In the same year, the Federal Land Banks were established, presaging a broad system of agricultural credit institutions with considerable government underwriting through the years.

The decade of the 1920's saw growing support for direct federal assistance to farm income, as witnessed by the McNary-Haugen controversy and the establishment of the Federal Farm Board.

Following the New Deal in 1933, a whole flood of preferential legislation for agriculture was unloosed. This flood tide continues unabated today, even though its direction may change occasionally.

RELATION WITH GOVERNMENT

Governmental aid to American agriculture has been more and more taking the form of direct aid to the individual farmer, which is extended in return for his compliance with some particular action program.

From the time of the creation of the USDA in 1862 until 1933, the emphasis of the Department of Agriculture was largely on indirect assistance to individual farmers through aid and encouragement to the agricultural industry generally. Such aids took the form of research, education through the land grant college system including the Agricultural Extension Service, and the regulatory functions of the Department of Agriculture with respect to both production and marketing. Direct payments were not made from the U. S. Treasury to individual farmers.

Now millions of farmers receive checks directly from the treasury for the feed grain program, the soil bank, conservation practices, soil fertility building, loans on crops, sale of crops and the like. It was inevitable that non-farmers begin to be critical of such practices. And criticism of this kind will always spill over to affect the research and educational work done for agriculture in our Land Grant Colleges.

Seldom before have our farm programs been so bitterly embroiled in partisan politics as today. Unprecedented numbers of urban residents, as well as urban congressmen, are *taking sides* in the farm controversy. And many of them are not friendly to agriculture.

HOSTILE URBAN ATTITUDE

Imagine for the moment that you live in downtown Chicago. You are several generations removed from the farm. Your work

is in no way connected with the agricultural industry. Your only contact with agriculture is your community grocery store and what you read in the newspapers. What are the things about agriculture that would probably irritate you?

The underlying reasons for the hostile urban attitude toward agriculture may be grouped into eight categories. Like all arguments, some of these are without foundation, and some with. They are

1. **High food costs.**
2. **Big farmers are getting rich.**
3. **Heavy cost of farm subsidies from taxes.**
4. **Program of planned food shortages in midst of surplus.**
5. **Special favors for agriculture, such as cooperatives, taxes, credit.**
6. **Sprawling and expensive USDA bureaucracy.**
7. **Agricultural research and education create costly surpluses.**
8. **Disproportionate political power in Congress and state legislatures for rural districts.**

We now turn to an examination of each of the eight urban attitudes listed to see which is true and which is not true.

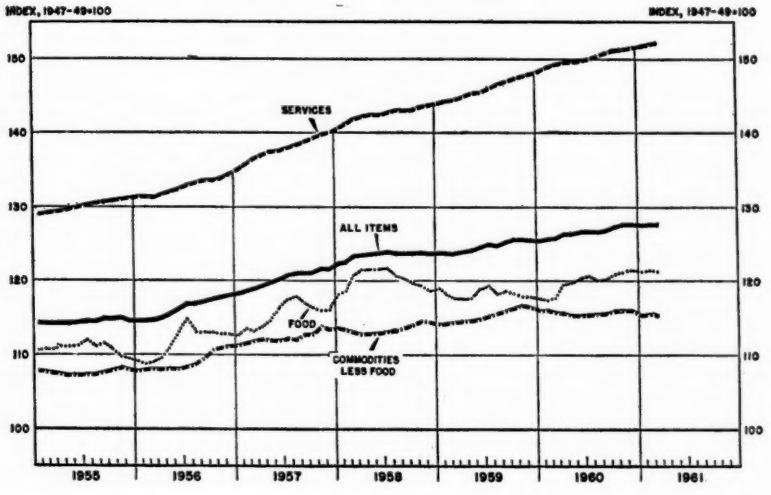
FACTS AND FANCIES

1. *High food costs*—This typical urban attitude is without foundation in fact. The retail price of food in America is only 6.6% above the level of 1952—nine years ago. Retail food prices in March, 1961 were 121.2 (1947-49 = 100), compared with 114.6 for the yearly average in 1952. In the meantime, purchasing power of our people has risen substantially. Over the same period of time, while food prices were rising 6.1 points, the index of all consumer prices rose 14.1.

Food is cheap and getting cheaper in terms of how long the industrial worker must work to pay for it. It is cheaper now than before World War II. It is cheaper now than it was in 1932, in terms of how long the worker must work to get food.

There is no other country today where the working man spends so small a proportion of time earning the food he eats as in America. There is no other country where the working man has so large a part of his working day left to buy the things that make life so pleasant.

INDEX OF CONSUMER PRICES



Some of us remember the "good old days" of 1914, when rib roast was only 20 cents a pound. But it took 48 minutes of labor to earn the money to buy a pound of rib roast then. Today it takes 20 minutes of labor, or 40 per cent of the time of a generation ago.

In 1914 bacon was 27 cents a pound. But it took an hour and 5 minutes of labor, as opposed to 19 minutes now. In other words, it took three times as long to get a pound of bacon. Today a working man gets his loaf of bread in 40 per cent of the working time it took him a generation ago.

Not only do we get foodstuffs in America with much less time spent, but we eat more and better foodstuffs than ever before in history. We're all "eating higher on the hog" and enjoying it tremendously. And it doesn't cost very much to do it either. The thing that bothers most Americans today is not so much the *high cost of living* as the *cost of high living*.

Foodstuffs come to the average American at bargain prices because research and education have made it possible for the great agricultural industry to produce in such abundance and so efficiently.

2. *Big farmers getting rich*—In the aggregate, this surely is not true. However, individual farmers who know their business are doing "okay" financially. But there is nothing wrong with that. Ours is an economy where the efficient and progressive are supposed to prosper.

Net farm income in recent months has been running at an annual rate of around $12.7 billion. While this is up from a couple of years ago, it's still one-fourth below the high of $16.8 billion in 1947.

On the other hand net incomes of individual farmers who know their stuff compare very favorably with net incomes of professional workers, skilled workers and business executives. But we must not permit urbanites to condemn agriculture because successful individuals make a satisfactory income. Successful farmers don't stay in the business just because they love it. They operate a *big business*, and must enjoy financial rewards commensurate with their capital investment and managerial input.

We therefore conclude that this urban attitude is without foundation.

3. *Heavy cost of farm subsidies*—This urban attitude is well founded. The USDA this year will spend an all-time record sum of something like $7.0 billion. Of course this isn't all subsidy. But in the neighborhood of $4.5 billion is for subsidy and price support payments, either in the current year or for prior program costs. While it may well be argued that not all of these sums represent direct subsidy to agriculture, yet the impression persists (we still live in the Chicago Loop) that it has been a pretty costly business. We are vaguely aware that tremendous sums are being spent for such things as commodity price supports, soil bank payments, agricultural conservation payments, CCC loans on farm commodities, soil conservation service, credit subsidies, surplus disposal, and the like.

We conclude that this urban attitude is well founded in fact. In defense, it can be pointed out that agriculture is not unique in receiving substantial subsidy. However, this type of argument is simply the pot calling the kettle black and is not valid.

On the other hand, we must refute the idea that all farmers want tax handouts. It is becoming increasingly clear that many farmers want freedom from governmental interference. They do not want their farms run from a desk in Washington.

The relatively large sign-up in the 1961 emergency feed grain program in no wise indicates general farmer approval of more government in agriculture. In this case,

the cash premium placed on compliance was so high that it simply *paid to go in.*

4. *Program of planned food shortages*—On this point we stand indicted. One reads in the paper that the government has purchased rather substantial sums of butter, cheese, and dried skim milk—acquired with taxpayers' money, in an effort to keep the price so high that consumers couldn't afford to purchase butter in the grocery store. We are also vaguely aware (we still live in the Chicago Loop) that all the corn, stored in steel bins and sealed cribs around the country, might have made pork a little more plentiful and steaks a little less costly had it not been priced into government storage rather than into feed lots.

And our tax dollars helped create this situation. We are not pleased. This typical urban attitude has substantial backing in fact.

5. *Special favors for agriculture*—This charge is largely true. Agriculture has long been the recipient of special favors—in aid for cooperatives, preferential treatment on taxes, easy credit, irrigation districts, soil conservation districts, electricity and a large variety of related items. Again, it can be argued that other sectors of the economy likewise have received special favors. That in no way detracts from the truth of the attitude held by urban people.

6. *Sprawling USDA bureaucracy*—This charge is true. USDA programs and personnel reach into every agricultural county of the country. A good deal of publicity has been directed to this situation in recent years. Some of this criticism spills over onto the agricultural extension personnel stationed in our agricultural counties, even though they are there to do an educational job and not to direct a federal farm program.

7. *Agricultural research and education create surpluses*—This charge is unfounded. Research and education create abundance. Abundance is desirable. Unwise price and distribution programs create the surplus. An abundance of food and fiber, produced efficiently and merchandised effectively, is the very cornerstone of a strong and expanding economy like ours. This can be attained only through the full application of science to the agricultural industry.

We conclude that this urban attitude is without foundation.

8. *Disproportionate political power in congress and legislatures*—Again agriculture stands indicted. The farm bloc in Congress exercises political power out of all proportion to the numerical strength of agriculture. This is true partly because the agricultural state of Nebraska, for example, has as much voting strength in the Senate as the industrial state of New Jersey. Most of our state legislatures are farmer-dominated, even in many states which are predominantly urban in character. The constitutional requirement for periodic legislative reapportionment in most states has been blandly ignored for many years. As a consequence, in many states city governments are severely circumscribed in authority, regulations and revenue. They are being economically strangled. Urban resentment against farmer political domination is multiplying yearly. The charge is true.

In summary—three of the eight bases for a hostile urban attitude toward agriculture are false, and five are true.

Meditating under this self-indictment, let us examine briefly certain political and sociological forces affecting the U.S.A.

DANGEROUS SITUATIONS

The farm program has become one of the really big issues in American government. Agriculture and big government have formed a permanent alliance. The extent of the alliance becomes broader with each passing year. The basis for the alliance

runs deeper than the particular politics of the administration in power in Washington.

Minority groups almost inevitably suffer in a government regulated economy. And agriculture is now a minority group. If the majority of voters become convinced that food prices can be *regulated,* the overwhelming ultimate pressure will be to regulate them downward. Most Americans believe in cheap food, not expensive food.

About 8 per cent of Americans now live on farms. Only 5 or 6 per cent are engaged in commercial agriculture. We are a numerical minority. Public revulsion against costly farm programs could quickly make us a political minority. The danger in this situation is real and imminent.

Agriculture is no longer "a way of life." It is now big business. The typical family commercial farmer is no longer a "little guy." He now has heavy capital investment, large cash receipts and expenses and operates like a business man. One of the reasons he has traditionally "enjoyed" the sympathy of non-farmers has now been removed.

Agriculture is no longer as *necessary* as formerly. This is the age of synthetics and substitutes. Producers of butter or cotton, for example, have discovered that consumers can get along pretty well without their products, if the price gets too high. The march of science may make people less dependent on agriculture than formerly.

WHAT TO DO ABOUT IT

Agriculture's public relation program must employ a dual attack. In the first place, we must correct the misconceptions of the non-agricultural public. They must be convinced that food is not expensive, and that food producers, processors and distributors are not *rolling in wealth* at the expense of food consumers. This information can be disseminated through our publications, our conversation, our public addresses and our advertising.

However, this is essentially a defensive technique. It is not the sole line of attack our industry must pursue. Indeed, it is not even the main line of attack.

The second prong of agriculture's public relations program must be designed to *correct our own errors.* It was observed earlier in this paper how five of the eight bases for the hostile urban attitude toward agriculture are pretty well founded in fact.

Efficient agricultural production and marketing must be stressed. This is the age of science and technology in agriculture. Output per worker in agriculture has doubled since 1940. It is still increasing rapidly. This step-up in efficiency must continue at an even accelerated rate.

No moratorium on research

We must all combat the philosophy which asserts that, because of current agricultural surpluses, we should "declare a moratorium on research and education."

This is a false and a dangerous doctrine. It was preached in 1920 when post World War I surpluses developed. Think where the country would be today if that philosophy had prevailed forty years ago. It was preached again in 1941, just before World War II, when surpluses again plagued us. Think for a moment of the situation now if we had listened to that just twenty years ago. The best way today to stop the steady march toward fulfillment of the American Dream would be to pull the rein on agricultural research and education. This we must never do.

Continued emphasis on agricultural research and education is a *must* for a productive, prosperous, and expanding America.

Profitable farming our goal

We must all stop portraying agriculture as our "poor country cousin." Our national literature and folklore are filled with im-

pressions of that kind. While that once may have been true of agriculture, it is no longer true. Commercial agriculture is now big business. There are good income opportunities for able farmers. The typical farmer accumulates ownership of a farm during the time he is also making a living from farming. In this respect he has an advantage over his city cousin.

Our goal in agricultural research and education for many decades has been to raise the level of farm incomes. On the whole, we have been rather successful. Let's admit success, rather than shout failure.

If agricultural efficiency continues to grow, as it should, some of the people on farms will move out of agriculture. So many farm programs are geared to "keeping them down on the farm." This is wrong. We should train young people off farms in areas where population must move out of agriculture. Many of them should be trained into useful service in the growing area of AGRI-BUSINESS. The Agricultural Colleges are tooled up to meet this need.

We must not use agriculture as an institutional burying ground to immobilize large numbers of people and resources we are not smart enough to utilize more effectively elsewhere.

We must all work to make the agricultural profession one of which we are proud. The dentist is proud of his profession, the lawyer his, the school teacher his, and the plumber his. Let's make farmers proud of their profession. It is truly one of which they should be proud. To do this we must dispel the "poor country cousin" attitude so many still have about agriculture. We must elevate the profession above the "alms-receiving" status.

NEEDED PUBLIC RELATIONS

Someone has defined public relations as making people like you. Another person has said public relations is doing your work in such a way that the public develops an appreciation of your work and of you. Some wag has defined public relations as that which you do when you can't get by with what you've been doing.

The definition of public relations that I like best is (1) living right and (2) getting credit for it.

Public relations is not the art of applying whitewash. It is not the business of

covering up
alibi and intrigue
high pressure propaganda
selling a "bad egg."

These are simply short time expedients. They don't produce lasting results.

The best public relations program is to live so that you don't need a public relations program.

If a cancerous sore is infecting agriculture's well-stream of public good will, let's dry up the sore. This will be better than repeatedly trying to treat the water.

Through the decades, American good will toward, and assistance for, agriculture has been tremendous. The net balance in the bank of public good will is still high. But time will run out on us one of these years. We need promptly to mobilize all resources back of an effective public relations program.

Pursuit of Quality

KARL R. BOPP
President
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Permit an alumnus to recall episodes in the critical middle third of his life which was spent on the Missouri campus as student and teacher. I recall vividly the acquisition of a wife, a son, loyal friends, stimulating colleagues, inquisitive students, an open but critical mind, academic degrees, foreign fellowships, and much else.

Commencement, however, is a time to look—not backward, but forward, even though at our present state of development no one knows what the future holds. Suppose we begin by looking forward some two or three decades. By that time many 1961 graduates will have attended graduation exercises for their children.

BASIC QUESTIONS

Although my training and experience are those of an economist, I shall say nothing about the challenging possibilities for Gross National Product, per capita income, or other economic magnitudes. Instead, I suggest a look forward by asking yourselves much more basic questions.

What would you like to have your children think of you as they graduate? What can you do to merit such thoughts? Contemplating your children's presumed thoughts in this way is most likely to reveal what is really important—one's basic motives. This is true because in dealing with your own child you are concerned with an individual you love deeply, who is of your own genes and blood. At the same time you are dealing with a person who is an individual in his own right, different from yourself and from everyone else. You must appeal to his heart and persuade his mind if you are to influence him.

Unfortunately, you cannot be sure that you know what is best. Nevertheless, three decades from now you may well consider that being a *parent* is one of the most humanizing educational processes known to man.

The tensions arising from the relationships between generations have not eased measurably in the century since Turgenev wrote his *Fathers and Sons*. The fundamental drift seems to have been in the direction envisioned by Turgenev—toward Bazarov, the nihilist, and away from Petrovitch, the mystic.

The different world developments in science, from nuclear physics to molecular biology, suggest that this drift is likely to continue. In any event, the world in which we live differs vastly from that expected by Turgenev's contemporary, Henry L. Ellsworth, Commissioner of Patents, who concluded in 1844:

The advancement of the arts from year to year taxes our credulity and seems to presage the arrival of that period when human improvement must end.

The basic origin of the explosive ideas, that have kept the mind and the Patent Office open, is the insatiable desire of man to know the unknown—to comprehend his role in the universe. You have become aware that knowledge is like an island in a boundless sea of ignorance. The more one learns—the larger his island, the greater its periphery, the more aware he becomes of what remains unknown! Hence, the extent of education is not measured by the number of questions one can answer.

The question, What is it? is only the starting point. Education begins when one asks: Why is it? What of it? What are we going to do about it? Then, like Jacob of old, one begins his night of wrestling. The breaking day will find him victorious only if, like Jacob, he is impelled to say: "I will not let thee go, except thou bless me."

LIMITATIONS OF SCIENCE

After asking such questions we find either that science is silent or that scientists respond with conflicting voices. The area of agreement among scientists narrows rapidly as more fundamental questions are asked. There is no agreement at all at the deepest levels, such as the ultimate philosophical—and theological implications of the DNA molecule. This makes one wonder how objective and impersonal science really is.

Even logic, that powerful mistress of systematic thought, is not infallible. Indeed, she has been described—not altogether facetiously—as an organized way of going wrong with confidence. I say this, not to soothe those who may have experienced difficulty with logic and science but rather to caution those, who feel themselves masters, not to expect more of these disciplines than they can deliver. The wind of change has opened even some of these most tightly closed doors.

Science has taken over large new territories through application of statistical methods. But, somehow, it does not really satisfy our inherent quest for certainty to be told that something has a very high degree of *probability*. Thus, the motions of the planets about the sun can be described and predicted accurately on the basis of scientific laws. No one, however, at this stage of development, pretends in any serious sense to *understand* the laws of motion and of gravitation.

THE UNIVERSITY'S ROLE

Candidates for degrees appreciate that a university plays a dual role in society. On the one hand it is a repository of accumulated knowledge. It has a faculty whose members master the intellectual heritage, received from our forebears, and pass it on to selected members from each new generation. It undertakes to train men and women who will shape their society on the basis of the accumulated knowledge from the past.

On the other hand, the professors are forever in quest of new truth which makes contemporary knowledge and contemporary society obsolete. This does not mean that a university is schizophrenic, working against itself. Instead, it functions in harmony with a society that is *not static* but developing.

Mankind is forever reaching beyond itself, and universities are among the chief agencies through which it does so. Should your University ever come under attack because it is discharging this function, I urge you to rise vigorously to its defense.

In this perspective, a contemporary test of a man's education is the degree to which he maintains an open mind toward at-

tempts to learn more about the universe in which he lives. The educated man will not harbor "the old conceit of being wiser than posterity—wiser than those who will have had more experience," as Jeremy Bentham phrased it. He will reveal himself in such qualities as:

— his zest for life
— his sense of humor
— his empathy with his fellow man
— the largeness and humility of his spirit
— the character of his mind, as reflected in the questions he asks as well as the processes by which he reaches conclusions.

LEARNING BY EXAMPLE

The professional man strives for quality. This, of course, is an ancient idea. I happen to have received it from my father. I told him that I would like to attend the University of Missouri. He thought it was a good idea and said he would help me earn my way by teaching me to be a carpenter.

He was an exacting teacher. My first assignment was to rip parting-beads for window frames from eight-inch boards. He made it look easy. With long, smooth strokes he quickly ripped several half-inch strips. When I tried it, the saw jerked, followed the grain of the wood instead of the pencil mark and assumed weird angles. Patiently, with a few deft strokes, he restored the saw to its proper position. We alternated this way—I getting off the mark and he returning to it—until he sensed my growing impatience.

At precisely the right moment, he said: "Suppose we try planing." At that point, I was willing to try anything that would get me away from sawing. He placed one of his strips in a vise and with one smooth stroke planed a uniform shaving and turned out a perfect parting-bead. Then he took one of my strips. He said: "Well, we will have to correct with the plane the mistakes you made with the saw. That is why you must become master of the saw, and of the plane, and of every tool in the box."

Then he generalized: "Life is like that. You will never regret the effort required to do something right. Sooner or later you will have to make up for what you do wrong. With perseverance, you will find it becomes easier and far more rewarding to do things right in the first place."

How much I appreciated training by a man of quality, as I observed hatchet-and-hammer men produce their shoddy results. My father taught me not to be satisfied with something that was *about right*. He insisted that it be *just right*. He did not look upon work as punishment but as a means of self-expression and he wanted to express the best that was in him.

He still derives great satisfaction from pointing out houses whose construction he supervised. He does not own the deeds to them, but in a very real sense they are *his* houses. His real reward has been at the level of his motives—not external but intrinsic. His reward for a service well done was the ability to render even better service. He has been a real professional.

Dr. Robert J. McCracken illustrated this point with a story in his sermon on "The Acquisitive Instinct in Religion":

A visitor to New York was impressed by the courtesy of a bus driver towards the passengers on his bus. After the crowd had thinned out he spoke to him about it. "Well," the driver explained, "about five years ago I read in the newspaper about a man who was included in a will just because he was polite. 'What in the world?' I thought. 'It might happen to me.' So I started treating passengers like people. And it makes me feel so good that now I don't care if I ever get a million dollars."

Reverend McCracken interpreted this experience in these words: "There you have an illustration of motives at two levels, of a man raising his sights, of virtue for its own sake yielding its own reward."

A NEW PHILOSOPHY

It is reasonable to assume that college graduates will have growing opportunities to shape the character of the institutions they join. Contemporary society is looking to its leaders to develop a new philosophy of the role and purpose of its institutions, particularly of the business enterprise.

One facet of this new role is the importance of recognizing the ambitions of the members who comprise the staff. Of course, there are individuals whose aspirations are beyond their competence. This should not be used, however, as an excuse to lower our sights with respect to the critical importance of human relations. In the final analysis, institutions exist to serve individuals, not the other way around.

An institution which strives for quality is marked by the attitude of its management toward the problems of human relationships. Among the goals are:

1. **To have each individual be and feel himself a necessary and therefore indispensable part of the institution.**
2. **To have each individual feel a compulsion to perform at the peak of his ability.**
3. **To reward each individual in proportion to his contribution to the joint product.**
4. **To have supervisors at all levels who want their subordinates to make good, who help them make good, and who rejoice with them when they do make good.**
5. **To prepare for the perpetuity of the institution despite the mortality of every individual in it.**

By this time it is apparent that the main burden of my message is an appeal to permeate our lives—and the lives of our institutions with the professional approach. This approach is not something to be taught in a formal training program or to be added for decoration. It should reflect itself in all that we do—as it will, if it is real.

Some may say that I am being impossibly naive or idealistic in appealing for professional standards, in urging the pursuit of quality. I do not think so. After all, exceptional educational privileges impose corresponding responsibilities. It may be that the professional approach is one of those feelings that must be experienced and not merely observed or read about to be understood. If so, my appeal is to strive for the experience.

To repeat, it encompasses a sense of duty to serve others as part payment for the thrill of sharing society's great adventure; a sense of humility before the mysteries of the universe, coupled with a burning desire to unravel them; a sense of pride in the achievements of institutions whose destiny one has helped to shape; a sense of contentment in having helped others to self-fulfillment.

PROFIT FROM THE UNEXPECTED

I should like also to hope that young people may be endowed with *serendipity*. This word was coined a couple of centuries ago by Horace Walpole, a great art collector. Every collector knows that he often makes his best finds while looking for something else, or even when simply browsing. Until recent editions, Webster defined serendipity as "the gift of finding valuable or agreeable things not sought for." Irving Langmuir, the Nobel laureate in chemistry, suggested "a more appropriate definition. 'Serendipity is the art of profiting from the unexpected.' "

Increasing knowledge seems to have been accompanied, not—as our forebears might have supposed—by a decrease but rather by an increase in the incidence of *the unexpected*. I see no reason to anticipate a change in this correlation. The unexpected will continue to happen—even more frequently, perhaps. May the reader have the gift—or the art—to profit from it!

SUMMARY

Once these attributes are acquired, you will find that you have a mind that never grows old. You will find also that your life, your family, your profession, and indeed the whole society of which you are a part will be enriched and made more significant.

Goethe, the greatest of German poets, exemplified much of what I have to say. He spent sixty years writing his masterpiece; but he completed his *Faust*. In the very first scene he says:

The inheritance that you have received
from your forebears,
Earn it, to make it truly your own.

In the very last scene he sums up the philosophy he developed over his lifetime in these words:

Yes, to this thought I hold with firm conviction,
The last result of wisdom stamps it true,
Only he earns life as well as freedom
Who daily must conquer them anew.

So, back to where we began, to consideration of your children. Remember that it is the children who will gradually take the places of parents as the loved ones who will be watching over your shoulders. What they will see is up to you.

Research Notes

THE B&PA RESEARCH CENTER

During the past few months the faculty of the School of Business and Public Administration has been considering the desirability of merging the Bureau of Business and Economic Research and the Bureau of Government Research. In March President Ellis and Dean Bradshaw requested that the Faculty Advisory Committee to the Bureau of Business and Economic Research and the Department of Political Science make recommendations concerning the wisdom of such a merger.

The Faculty Advisory Committee and the Department of Political Science were unanimous in recommending that a *Research Center* in the School be created. In June the general faculty of the School approved the recommendation and the Board of Curators approved the creation of the *Center*. Operations began on July 1.

Reasons for the merger

Behind the move to combine the two bureaus were several considerations. The School of Business *and* Public Administration is one of few business schools in the nation which encompasses political science. Thus, it possesses advantages from the standpoint of organization for including in its research program work in accounting and statistics, business management, economics, and political science. A single research office might bridge these content areas with mutual benefits for all.

Also, many studies today make use of portions of several disciplines. The *Research Center* is a logical vehicle for undertaking studies in urban economics, in taxation, in transportation, in management science and in government policy, as well as many similar areas requiring interdisciplinary treatment.

Then too, the combining of the research function in a single agency makes it possible to achieve efficiencies in time and money. A greater degree of specialization can be realized by programming the total research activity in terms of problem areas. The operations should become more efficient and a greater total research product turned out per dollar of cost.

Professional personnel

Professional personnel attached to the new *Research Center* include a director, two assistant directors, and a research associate and editor of publications. Because of the close relationship between the *Research Center* activity and the teaching program of the School, each professional staff member of the *Center* teaches a maximum of three hours of courses each semester during the regular academic year.

The program

The *Research Center* is an integral part of the program conducted in the School of Business and Public Administration. It provides resources and sponsors both individual faculty research projects and group studies in the fields of accounting and statistics, business management, economics, political science and public administration.

In addition to supporting studies proposed by faculty members, the *Center* program provides resources for coordinated

professional projects of significant importance for the future of the State and Nation.

The *Center* offers a training ground for undergraduate and graduate student assistants who are selected by faculty members engaged in research activity.

The *Research Center* program is supported by State appropriations and by grants from public and private sources. The criteria used in determining the acceptability of grants are:

1. The study must be designated as a useful undertaking for trained scholarly personnel.
2. The study or results thereof shall involve no exclusive benefit accruing to the donor.
3. Study investigators shall be completely free to reach their own conclusions in keeping with the highest standard of academic responsibility.
4. Publication rights are reserved to the University of Missouri and may be released on a permissive basis.
5. The results of studies and conclusions of research personnel which are published as a part of completed studies are not guaranteed or endorsed by the University or the donor.

The bimonthly *Business and Government Review* (previously *Business and Economic Review*) provides a vehicle for the publication of articles of current interest on a wide variety of topics. Emphasis is given to problems concerning business, economics and government relations. Although the *Research Center* program is designed primarily to encourage research undertakings by the faculty of the School of Business and Public Administration, appropriate research interests of faculty members in other Schools and Departments of the University are included in specific projects.